By integrating measurement, documentation, and control systems, the use of *Intelligent Compaction (IC)* rollers allow for real-time corrections in the compaction process. IC rollers maintain a continuous record with color-coded plots that include the number of passes, stiffness values, temperature (HWA/ WMA), frequencies, amplitude, and roller speed as well as the location of the roller drum.

Interior Display for IC
(Source: www.fhwa.dot.gov)

Compaction is one of the most important processes in roadway construction. It is needed to achieve consolidation and uniformity of the materials, which in turn better ensures a stable base platform and pavement surface. Construction materials possess optimum densities that ensure adequate support, stability, and strength. Achieving these densities consistently and uniformly is extremely important. Current processes using conventional compaction equipment may result in inadequate and/or non-uniform material densities, which can be one of the factors that result in premature failure. Intelligent Compaction helps to overcome this.

Benefits of IC

The benefits of *Intelligent Compaction* include:

- Continuous record of material stiffness values, coverage and temperature.
- Improved uniform and consistent densities.
- Identification of non-compacted areas.
- Increased productivity in terms of knowing when and where to apply compaction effort.
- Elimination of over and under compaction.
- Encourages best roller compaction practices.

Uniformity in Density

The potential for IC technology to improve the *in-place* density of construction materials, is well documented from projects in Europe, Asia, and the United States. The biggest improvement is in a significant decrease of the variability of measured density. Compaction processes that can produce consistently high and more uniform density offer agencies and the public roads users a much better return on their capital investment increasing the service life and reducing maintenance costs in the life cycle.

Sheep Foot Roller
(Source: www.Intelligentcompaction.com)

Continuous Record of Material Stiffness Values

The ability to continuously measure stiffness during the compaction process, aids in determining optimum compaction throughout the entire project which in turn provides a unique way to guarantee full coverage of the entire project area. Also, another benefit is the "on the fly" identification of weak areas that need to be corrected, re-done, or re-compacted, to avoid pavement performance issues in the future.

Roller with IC (Source: www.fhwa.dot.gov)

Identification of Non-Compactable Areas

By comparing the results of subsequent passes, an evaluation can be conducted to determine whether support from the underlying materials is adequate to allow compaction of the new material. The capability to detect projects or portions of projects that will not allow sufficient support in a non-subjective way is an innovative and important tool for the project personnel. Using this technology, the project personnel can then make a rational decision about the proper course of action to address this problem. The decision may be: remove and replace the underlying materials, stabilize and re-compact the underlying materials, or modify the compaction requirements for the material being used.

IC is ready to be implemented in Puerto Rico

Intelligent Compaction is a technology that is proving to be effective. It has been piloted already in Indiana, Louisiana, Minnesota, Texas, Vermont, Rhode Island, Utah, Tennessee and Georgia. Contractors are using this technology to improve productivity in terms of time and money. *The Federal Highway Administration* (FHWA) has conducted a series of IC workshops which have been very successful in providing demonstrations and information to states and Contractors. Consequently, IC was identified by the *Intelligent Construction Systems and Technologies* workshop conducted by FHWA in September 2011 as one of the key technologies FHWA should move forward in the years to come. Also this technology has been selected under the second phase of the federal program *Everyday Day Counts* (EDC).

The island of Puerto Rico in cooperation with the *Transportation Technology Transfer Center* at UPRM, under contract with the *Puerto Rico Department of Transportation and Public Works (DTPW)*, the *Virgin Islands Department of Public Works (DPW)* and the *FHWA,* serve as the Technical Oversight leaders for the implementation of the technologies of the EDC Initiatives for Puerto Rico and the U.S. Virgin Islands. The four (4) initiatives selected by Puerto Rico and U.S. Virgin Islands are Intelligent Compaction, Accelerated Bridge Construction, 3D Engineered Models for Construction, and Programmatic Agreements.

As part of the implementation plan for these activities the *Transportation Technology Transfer Center* will be conducting a ***EDC*** II ***Research-to-Practice*** Symposium in St. Thomas, USVI on June 17 & 18, 2013.

IC Data Management-Veda Workshops

Learn more about Intelligent Compaction enrolling in the following one day duration workshop series:

- Introduction and Overview (30min.)
- Fundamentals of IC (40min.)
- Global Positioning System (GPS) (40min.)
- IC Systems and Measurement Values (50min.)
- Practical Implementation of IC – I (50min.)
- Practical Implementation of IC – II (50min.)
- More Hands-on with Veda (50min.)

For more information you can visit the website: *www.IntelligentCompaction.com* or you can contact Antonio Nieves at (202)-366-4597 or at email: antonio.nieves@dot.gov.